

Claims

[30020101 US]

1. Apparatus for monitoring channel performance in Dense Wavelength
Division Multiplexed (DWDM) optical networks, the apparatus comprising an
5 optical input for receiving an optical signal from a DWDM optical network, a
tunable optical channel selection filter coupled to the optical input and having an
output, a tunable optical notch filter having a bandwidth substantially narrower
than that of the tunable optical channel selection filter and having an input
coupled to the output of the tunable optical channel selection filter and an
10 output, an optical signal to electrical signal converter having an input coupled to
the output of the tunable optical notch filter for receiving an optical signal from
the output of the tunable optical notch filter, and for converting it into a
corresponding electrical signal, and signal processing means having an input
coupled to the output of the optical signal to electrical signal converter for
15 processing the corresponding electrical signal and an output for providing a
processed signal.
2. Apparatus according to claim 1, wherein the optical signal to electrical
signal converter comprises at least one photodetector for receiving the filtered
20 optical signal from the output of the tunable optical notch filter and for providing
an electrical signal corresponding to the received filtered optical signal.
3. Apparatus according to claim 2, wherein the signal processing means
receives the electrical signal from the photodetector.
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4. Apparatus according to claim 1, further comprising a control means for
controlling the tuning of at least one of the tunable optical notch filter and the
tunable optical channel selection filter.
- 30 5. Apparatus according to claim 1, further comprising a wavelength
reference source for providing a wavelength reference for calibrating the
wavelength of at least one of the tunable optical channel selection filter and the
tunable optical notch filter.

6. Apparatus according to claim 1, wherein the signal processing means includes means for carrying out channel transmission analysis, which may include Bit Error Rate (BER) tests and/or protocol bases analysis.
- 5 7. Apparatus according to claim 1, wherein the signal processing means includes means for carrying out optical spectral analysis, which may include wavelength or Signal to Noise (S/N) ratio analysis.
8. A method for monitoring channel performance in Dense Wavelength
10 Division Multiplexed (DWDM) optical networks, the method comprising the steps of:
receiving an optical signal from a DWDM optical network,
passing the optical signal through a tunable optical channel selection
filter,
15 passing the optical signal from the tunable optical channel selection filter through a tunable optical notch filter, and
processing the optical signal from the tunable optical notch filter to determine channel performance in the optical network.
- 20 9. A method for monitoring channel performance according to claim 8, further comprising the step of converting the optical signal from the tunable optical notch filter into a corresponding electrical signal prior to the processing step.
- 25 10. A method for monitoring channel performance according to claim 8, further comprising the step of controlling the tuning of at least one of the tunable optical notch filter and the tunable optical channel selection filter.
11. A method for monitoring channel performance according to claim 8,
30 further comprising the step of calibrating the wavelength of at least one of the tunable optical notch filter and the tunable optical channel selection filter.
12. A method for monitoring channel performance according to claim 8, wherein the step of processing includes the step of channel transmission

analysis which may include Bit Error Rate (BER) tests and/or protocol bases analysis.

13. A method for monitoring channel performance according to claim 8,
5 wherein the step of processing includes the step of optical spectral analysis, which may include wavelength or Signal to Noise (S/N) ratio analysis.